

Personal and work related factors influencing exposed handling of asbestos among dealers in Ifo local government area of Ogun State, Nigeria

Babawande S. A. and *Awesu T. K.

Tai Solarin University of Education, Ijagun Ogun State, Nigeria

ABSTRACT

Asbestos is a common material in buildings and auto-mobile brake system. Inappropriate exposure to it and poor handling are known to be harmful to human health. This study investigated personal and work related factors influencing exposed handling of asbestos among dealers in Ifo Local Government Area of Ogun State, Nigeria. The study was a descriptive survey research. Multistage sampling was used to select six hundred respondents. Self-developed, structured, expert validated and reliable ($r=0.82$) questionnaire was used. Frequency counts, percentages and multiple regressions were used to analyze gleaned data. Regression results showed that age, sex and work intensity or magnitude would significantly influence exposed handling of asbestos among the dealers. It was recommended that the policy of companies in the asbestos industry should include work hour regulation, broad based safety training to all staff and youngsters should not be exposed to asbestos. Years of experience should be considered together with appropriate and modern personal protective equipment for all sexes.

*Corresponding Author
awesutk@tasued.edu.ng

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Introduction

Asbestos is one of the widely used minerals in building constructions, automobiles, water pipes and heat resistance. Nonetheless, its uses and handling may be injurious if one is not adequately informed. Asbestos is a group of natural minerals used in producing many products because it adds strength and ensure heat and chemical-resistance. Tossavaine (2004) averred that asbestos is popular in some areas because of low cost of the material and its effectiveness in protecting from sun, rain and other natural hazards. Health and Safety Executives (2019) reported that asbestos can be found in houses, factories, schools, offices, hospital built earlier than year 2000 and resulted in an estimated 5000 deaths every year in United Kingdom.

Health and Safety Executives (2019) documented that unguided exposure to asbestos are injurious to health. Some individuals in Nigeria, especially those in building sector exposed themselves to asbestos and asbestos products without circumspect, thus predisposing themselves to asbestos related ill-health conditions. Several factors may solely or jointly determine or influence exposed handling of asbestos products among the dealers in Ifo Local Government Area of Ogun State. The probability of age, sex, access to safety information, poverty, educational background, work intensity or magnitude and knowledge of health implications of handling asbestos are yet to be investigated in the study area.

World Health Organisation WHO (2018) reported that about 20 trades' people on average die every week from asbestos related ailments. Asbestos can be found in houses or buildings built before the year 2000. About 125 million people in the world are exposed to asbestos at work place. An estimated half of the deaths from occupational cancer are attributed to be caused by asbestos. It is estimated that several thousand deaths annually can be attributed to exposure of asbestos in the home. Asbestos still remains in many homes, business premises and public buildings till today. Asbestos related tasks when done frequently, even small jobs like drilling a hole can expose anyone to the danger of asbestos related hazards (WHO, 2018). It is important for individuals to understand the risks, especially if they have a history of asbestos exposure. People who handle and or are exposed should be aware of potential risk factors, personal health implications, safety practices in handling asbestos and how to protect themselves.

Literature Review

Asbestos as a geologic term means a group of naturally occurring silicate minerals that form fibers during crystallization (Perry, 2004). Asbestos is a group of six types of naturally occurring minerals which are made up of durable fibre that are resistant to heat, fire and many chemicals. Some called it "miracle mineral" for possessing those properties. Asbestos is used in a large quantity every day in products, from building materials to fire-proof protective gear. It is widely known by scholars that exposure to asbestos can cause fatal ill health All asbestos minerals have common characteristics. They are odourless and tasteless. When asbestos is present in a mineral or product, one cannot detect it by a visual means and must be tested in a laboratory for confirmation. These properties often make it difficult to determine specific risks of asbestos to pleural mesothelioma and other diseases such as lung cancer or asbestosis.

Agency for Toxic Substances and Disease Registry ATSDR (2017) reported that all forms of asbestos are considered hazardous. However, different types of asbestos may be associated with different health risks. For instance, it is documented that Amphibole forms of asbestos may be more harmful than Chrysotile, particularly for mesothelioma because Amphibole has the tendency to stay in the lungs for a longer period of time. ATSDR (2017) further averred that people may be exposed to asbestos in various places like workplace, communities and homes. When products containing asbestos are disturbed, its particles may be released into the air. The accumulation of this particles may result in scarring and inflammation, which can affect breathing and lead to serious health implications. Asbestos has been classified as a known cancer causing agent by the United State Department of Health and Human Services (USHHS), the United State Environmental Protection Agency (USEPA), and the International Agency for Research on Cancer (IARC). According to IARC, there are enough evidences that asbestos causes mesothelioma, a relatively rare cancer of the tiny membranes that line the chest and abdomen, and cancers of the lung, larynx, and ovary.

However, mesothelioma is the most common form of cancer that is linked with asbestos exposure. There are proofs that asbestos exposure are associated to an increased risks of cancers of the stomach, pharynx, and colo-rectum.

Exposure to asbestos was said to be capable of increasing the risk of asbestosis (an inflammatory condition, that affect the lungs which causes shortness of breath, coughing, or permanent lung damage) and other non-malignant lung and pleural disorders, as well as pleural plaques (changes in the membranes which surround the lung), pleural thickening, and benign pleural effusions (abnormal collections of fluid between the thin layers of tissue lining the lungs and the wall at chest cavity). It should be noted that pleural plaques are precursors to lung cancer, medical evidences suggest that people with pleural disease resulting from exposure to asbestos may be at high risk to lung cancer.

Tossavaine (2004) further stated that, due to high durability and tensile strength, asbestos is used in many other places like water pipes, manufacture of pressure and non-pressure pipes used for supplying water, irrigation, sewage and drainage system in both rural and urban areas. Aside, asbestos laminated products like packing ropes, textiles, tape, gland packing, brake lining and jointing used in industries like automobile, heavy equipment, petro-chemicals, nuclear power plants, fertilizers, thermal power plants, transportation and defense and so on exist.

Asbestos sheet is a common roofing commodity used in both rural and urban areas of Nigeria. Despite its wide application, the health hazardous effect cannot be under looked.

Asbestos tend to break into microscopic fibre and once released in air may stay suspended in the air for hours or even days. The word 'asbestos' means 'unquenchable' or 'indestructible' in Greek. It is the nature of fibre that permit resistant to chemicals and heat, asbestos cannot be vaporized or dissolved in water, and they are not even biodegradable. Global Environmental Technology Foundation (2003) and USEPA (2004) stated that Lung Cancer or bronchogenic carcinoma can also be as a result of asbestos exposure, and cigarette smoking which is capable of increasing the risk of lung cancer by about 50%.

The Conceptual framework of the study: The independent variables in this study are age, sex and work intensity or magnitude of work while the dependent variable is 'exposed handling'. The moderating variables are income, incentive, recurrent respiratory diseases and government regulations. Respiratory diseases and skin cancer are some of the effects or consequences of exposed handling of asbestos among dealers in Ifo Local Government Area of Ogun State Nigeria.

The theoretical framework for the study is Heinrich Domino Theory: The theory is based on the sequence of events that precede an incident. The dominos are: faults in person, ancestry and social environment, unsafe act and /or mechanical or physical hazard and incidents. The theory offers that: potential injury can only happen due to an injury (final domino), an accident only occur owing to personal or mechanical hazard, hazards only take place as a result of people faults, faults of people are bequeathed, born bred and educated, thus by removal of an optical domino stops the consequence. This can be achieved by training and provision of information to make people aware of dangers in places.

Data and Methods

The study examined the factors influencing exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State, Nigeria. This study was a descriptive research of the survey type that deals with systematic description of events in factual and accurate manners. It was considered appropriate because it examined existing phenomena, thus no manipulation of any variable. The population comprised all asbestos dealers in Ifo Local Government Area of Ogun State, Nigeria. The sample size was six hundred dealers in asbestos products. Multistage sampling was used to select the sample, thus:

- Ifo Local Government Area was divided based on the existing political wards. Agbado, Akute/Ajuwon, Coker/Ilepa, Ibogun, Ifo1, Ifo2, Ifo3, Isheri Olofin, Oke-Aro/Ibaragun/Robiyan, Ososun and Sunren wards.
- Asbestos products dealers were divided into specialization of distributor, retailers, transporters and carpenters.
- Proportionate stratified sampling technique was used to select 25% distributors, 25% retailers, 25% transporters and 25% carpenters of the total intending sample population.

The above sampling techniques were considered appropriate because it ensured greater representation of the sample relative to the population and guarantees that minority element or constituent of the population were represented in the study. The instrument that was used for this project was self-developed, structured, expert validated and reliable questionnaire. This was designed by the researchers through related literature that were reviewed. The questionnaire consisted two parts (A and B). Section A contained question items related to personal data of the respondents. Section B consisted of relevant question items on the factors influencing exposed handling of asbestos products among the dealers in Ifo Local Government Area of Ogun State. The questionnaire was a closed-ended type designed in line with summated Likert scale with graded score. The responses options were: S.A- Strongly Agree, A- Agree, D- Disagree, S.D- Strongly Disagree. The research instrument was given to Tests and Measurement Expert and Supervisor for content and face validity. Contributions, suggestions, observations, corrections, comments and judgment regarding clarity of questions by eminent scholars/ distinguished lecturers at academic seminar were incorporated before the instrument was finally produced and administered. The instrument was given to 10 asbestos dealers in Ado-Odo Ota Local Government Area of Ogun State that were not part of the study. The challenges encountered in the administration enhanced planning and administration of the questionnaire to the real respondents. The data carefully collected during pilot study of one administration to 10 persons in Ado-Odo Ota Local Government Area of Ogun State was subjected to Cronbach Alpha analysis to determine the internal consistency ($r = 0.82$) of the instrument. The researcher collected a letter of introduction from the Head of Department Human Kinetics and Health Education, Tai Solarin University of Education Ijagun Ogun State Nigeria. The letter of introduction was presented to Executives of asbestos dealers (distributors, retailers, transporters, and carpenters) for introduction and approval to reach asbestos dealers. Thereafter, the questionnaire was administered to the selected members of each group on their meeting days using six trained research assistants. The asbestos dealers were educated on the importance of the research work by the researchers. The instruments were collected after filling the same day they were administered so as to ensure 100% return rate. The data gleaned from the respondents were analyzed using Multiple Regression Analysis.

Results

Data gathered were presented according to the order in which they were arranged in the questionnaire. The responses were grouped and tabulated toward ensuring an objective analysis and interpretation of the findings. Simple percentage was used to analyze the respondents' demographic information while regression analysis was used to analyze the statistical relationship between personal, work related factors and their influence on exposed handling of asbestos products among dealers in the study area.

The demographic information of the respondents shows that 442(73.7%) of the respondents were males while 158(26.3%) of the respondents were females. This indicates that majority of the respondents were males. Age indicates that 14(2.3%) of the respondents fall within the age bracket of ≤ 19 years, 231(38.5%) of the respondents fall within the age bracket of 20 - 39 years, 282(47.6%) of the respondents fall within the age bracket of 40-59 years, while 73(12.2%) of the respondents fall within the age bracket of 60 years and above. With these information, we can deduce that majority of the respondents were 40 - 59 years. It was gathered that 61(10.2%) of the respondents were from ward1, 62(10.3%) were from ward2, 53(8.8%) were from ward3, 63(10.5%) were from ward4, 81(13.5%) of the respondent were from ward5, 70(11.7%) were from ward6, 72(12.0%) were from ward 7, 44(7.3%) were from ward8, 48(8.0%) were from ward9, 28(4.7%) of the respondents were from ward10 while 18(3.0%) were from ward 11. With these information, we can deduce that majority of the respondents were from ward5. It was also deduced that, 420(70.0%) of the respondents claimed that they have high daily work load while 180(30.0%) of the respondents have low daily work load. In conclusion majority of the respondents have high daily work load.

Testing of Hypotheses

Hypothesis 1: Age of the dealers will not significantly influence exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State.

Table 1: Regression Analysis of Hypothesis One

Parameter Estimates		Analysis of Variance				
Variable (s)	Co-efficient of parameter estimate (B)	Standard Error	T	Df	F	Sig
Age	0.939	0.015	63.921	599	4085.921	0.000 ^a

Dependent Variable: Exposed handling of asbestos products

Table 1 shows that independent variable (age of dealers) has significant influence on exposed handling. It can be explained that older asbestos dealers were more likely to take precautionary steps during exposed handling of asbestos products than their younger counterparts who were more likely to engage in risky health behaviours when it comes to exposed handling of asbestos products. The calculated value is 63.921 while the tabulated value is 1.97 at 5% level of significance, since the calculated value is more than the tabulated value, it can be concluded that there is significant relationship between age and exposed handling of asbestos products among dealers. Furthermore, it is observed that the standard error (0.015) is less than half of the parameter estimate ($\frac{1}{2} \times 0.939 = 0.4695$).

The result of R-Squared showed that the model has a good fit and age accounts for about 87.2% variation in exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State. Even after adjusting with the degree of freedom; the adjusted R-Squared showed that age accounts for 87.2% systematic variation in Ifo Local Government Area of Ogun State. The f-test showed that there is joint significant relationship between age and exposed handling of asbestos products among dealers in in Ifo Local Government Area of Ogun State as shown with calculated f-test which is 4085.921 with low probability value of 0.000 which is extremely more than 0.05 using 5% level of significance.

Hypothesis Two: Sex of the dealer will not significantly influence exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State.

Table 2: Regression Analysis of Hypothesis Two

Parameter Estimates			Analysis of Variance			
Variable (s)	Co-efficient of parameter estimate (B)	Standard Error	T	Df	F	Sig
Sex	0.834	0.014	60.144	599	3617.313	0.000 ^a

Dependent Variable: Exposed handling of asbestos products

Table 2 shows that independent variable (sex of dealers) has significant influence on exposed handling. The result of the test showed that sex of dealer significantly influenced exposed handling of asbestos products among dealers. To buttress this observation, it can be explained that the asbestos industry is mostly male dominated, as the occupation is physically painstaking and requires heavy manpower. The females in the industry are mostly involved in the sales and marketing of asbestos products. The test of the statistical significance using t-test and standard error showed that there is significant contribution of sex to exposed handling of asbestos products among dealers. The T-calculated is 60.144 while the t-tabulated is 1.97 at 5% level of significance. Since the calculated t-value is more than the tabulated t-value it can be finalized that there is significant relationship between sex and exposed handling of asbestos products among dealers. Furthermore, it is observed that the standard error (0.014) is less than half of the parameter estimate ($\frac{1}{2} \times 0.834 = 0.417$). The result of R-Squared showed that the model has a good fit and sex accounts for about 85.8% variation in exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State. Even after adjusting with the degree of freedom; the adjusted R-Squared showed that sex accounts for 85.8% systematic variation in Ifo Local Government Area of Ogun State. The f-test showed that there is joint significant relationship between sex and exposed handling of asbestos products among dealers in in Ifo Local Government Area of Ogun State as shown with calculated f-test which is 3617.313 with low probability value of 0.000 which is extremely more than 0.05 using 5% level of significance.

Hypothesis Three: Work intensity will not significantly influence exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State.

Table 3: Regression Analysis of Hypothesis Three

Parameter Estimates			Analysis of Variance			
Variable (s)	Co-efficient of parameter estimate (B)	Standard Error	T	Df	F	Sig
Sex	0.868	0.017	50.192	599	2519.224	0.000 ^a

Dependent Variable: Exposed handling of asbestos products

Table 3 shows that independent variable (work intensity) has significant influence on exposed handling. The result of the test showed that work intensity significantly influenced exposed handling of asbestos products among dealers. In furtherance, it can be explained that lesser workloads may discourage safety practices among asbestos dealers. However, heavy workloads may require extra precautions in order not to suffer health complications in the course of handling. The test of the statistical significance using t-test and standard error showed that there is significant relationship between work intensity and exposed handling of asbestos products among dealers. The T-calculated is 50.192 while the t-tabulated is 1.97 at 5% level of significance. Since the calculated t-value is more than the tabulated t-value, it can be generalized that there is significant relationship between work intensity and exposed handling of asbestos products among dealers. Besides, it was observed that the standard error (0.017) was less than half of the parameter estimate ($\frac{1}{2} \times 0.868 = 0.434$). The result of R-Squared showed that the model has a good fit and work intensity accounts for about 80.8% variation in exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State. Even after adjusting with the degree of freedom; the adjusted R-Squared showed that work intensity accounts for 80.8% systematic variation in Ifo Local Government Area of Ogun State. The f-test showed that there is joint significant relationship between work intensity and exposed handling of asbestos products among dealers in in Ifo Local Government Area of Ogun State as shown with calculated f-test which is 1848.552 with low probability value of 0.000 which is extremely more than 0.05 using 5% level of significance.

Discussion of Findings

The researcher responses obtained through the research instruments were subjected to regression for statistical inferences to be made in the study. The findings are therefore discussed below.

Hypothesis One: Regression results showed that age of the dealer will significantly influence exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State. This result is similar to that of Wuellner (2016) whose study revealed that older workers are at increased risk of fatal occupational injuries. To better understand work-related injuries suffered by older workers, we used three measures of occupational injuries, each of different severity, to examine patterns of work-related injuries by worker age across industries. When compared to younger workers, older workers are at increased risk for fatal injuries and hospitalizations within one day of work injury. This same pattern was not observed for workers' compensation claims; workers aged 65 and older experienced among the lowest rates of workers' compensation claims. When older workers did experience an injury resulting in a workers' compensation claim, the outcome was often more severe. Claims among older workers are more likely to be for wage

replacement benefits (as opposed to limited to medical-aid), and claims among older workers are more likely to involve hospitalization within 1 day of work injury.

Hypothesis Two: Results of the regression analysis revealed that sex of the dealer will significantly influence exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State. The result aligned with the works of Karen, S. and Glenda S. (2019). Here, it was opined that women now account for a larger percentage of the active work force than in earlier decades and women are expanding into traditionally male-dominated trade and craft occupations. As a result of these occurrences, there are now more women in occupations that are in the past had higher injury rates. If injury rates are different for male and female workers, it is important to determine what factors explained those differences so that training and injury prevention programmes and better work practices can be appropriately designed and implemented.

Hypothesis Three: Furthermore, the study affirmed that work intensity will significantly influence exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State. This finding agrees with that of Boxal and Macky (2014) who compared the effects of work intensity on employee well-being, and emphasize the importance of including work intensification in the assessment of occupational safety. Work intensity is considerably more powerful and consistent predictor of work and health outcomes than hours worked. According to the authors, at individual level, work intensity has negative outcome for employee's poorer well-being in terms of fatigue, job-induced stress and work life balance, insomnia, irritability, burnout, turnover and sickness, physical exhaustion and mental stress, and in terms of lower job satisfaction, especially in a coercive, non-rewarding work environment.

Limitations of the study

The following limitations were encountered. It was relatively difficult in getting respondents -asbestos dealers to fill the research instruments as they were mostly busy with their time-bound routine activities. Some of the respondents were not willing to divulge information as they felt it might not be confidential and for fear of unknown. Language barrier also affected some of their responses to the questions raised.

However, adequate measures were put in place so that these did not confound the result. The research assistants targeted the dealers to determine the time of their area meetings. The researcher produced a Yoruba and Pidgin versions of the questionnaire to bridge the language barrier. The researcher engaged the leader and distinguished persons within the groups to assist with the administration of the questionnaire forms. Finally, the researcher assured them of confidentiality of their information as the data are for research purposes.

Conclusion

The study identified a number of personal and work-related factors that influence exposed handling of asbestos products among asbestos dealers in Ifo Local Government Area of Ogun State. Based on the findings, the study concluded that:

Age of the dealers, sex of dealers and work intensity would significantly influence exposed handling of asbestos products among dealers in Ifo Local Government Area of Ogun State.

Recommendations

Based on the conclusion, the following recommendations are expedient:

- The policy of companies in asbestos industries should include work hours regulations and broad based safety training to all exposed persons in the chains of work.
- Modern personal protective equipment's (PPEs) suitable for all sexes should be provided for dealers in the asbestos industries to improve compliance.
- Youngsters, for lack of instincts in moderation of behaviours and aversion of risks, should not be engaged in handling of asbestos.
- There should be unannounced supervision of all persons in asbestos handling companies to ensure compliance with hazards control methods.
- Stakeholders in asbestos industries should recognise that the most efficient way to eliminate asbestos harms is to replace asbestos with safer substitutes through collaborative efforts.

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